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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CARL B. FRANKEL, STEVEN A. SIVIER,
JAMES P. FREYENSEE, and CARL CAVANAGH

Appeal 2008-2855
Application 10/007,816
Technology Center 2100

Decided: November 17, 2008

Before KENNETH W. HAIRSTON, JOHN A. JEFFERY,
and KARL D. EASTHOM, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Final Rejection of claims 1-6, 10-11, 13-25, and 27-37. (App. Br. 2). However, subsequent to the appeal, the Examiner withdrew the rejections to claims 11, 13-19, 28, 30 and 37, and also rejections based upon a prior art reference to Preiss (Ans. 2-3). Accordingly, claims 1-6, 10, 20-25, 27, 29, and 31-36 are before us. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part

Appellants' invention relates to a distributed simulation system including a plurality of nodes to perform a simulation of a system under test. The plurality of nodes communicate simulation command and signal values of the system under test using message packets transmitted between the plurality of nodes. At least one of the nodes is configured to log the message packets in one or more log files during the simulation (Spec. Abstract; Fig. 1). Claim 1, exemplary of the claims on appeal, follows:

1. A distributed simulation system comprising:

> two or more computer systems configured as a plurality of nodes arranged to perform a simulation of a system under test, wherein the plurality of nodes are configured to communicate simulation commands and signal values for the system under test using message packets transmitted between the plurality of nodes, and
>
> at least one logging node of the plurality of nodes is configured to log the message packets in one or more log files on at least one non-volatile storage medium during the simulation, wherein the at least one logging node is separate from nodes targeted by the message packets.

The Examiner relies on the following prior art references to show unpatentability:

Ulrich	US 5,466,200	Nov. 14, 1995
Stallmo	US 6,289,398 B1	Sept. 11, 2001

Om P. Damani, *Fault-Tolerant Distributed Simulation*, Parallel and Distributed Simulation (PADS 98), Proceedings, Twelfth Workshop, pp. 38-45, May 26-29, 1998. (*hereinafter* "Damani").

Ian Foster, *Modular Design Review*, Designing and Building Parallel Programs, Ch. 4.1, 1995, *avail.* at http://www-unix.mcs.anl.gov/dbpp/text/node40.html (*hereinafter* "Foster").[1]

Claims 1, 20, and 31 stand rejected as anticipated under 35 U.S.C. § 102(b) by Damani.

Claims 1, 6, 10, 20, 25, 27, and 31 stand rejected as anticipated under 35 U.S.C. § 102(b) by Ulrich.

Claims 2-5, 21-24, and 32-35 stand rejected under 35 U.S.C. § 103(a) as being obvious under 35 U.S.C. § 103 based on the collective teachings of Damani and Stallmo.

Claims 29 and 36 stand rejected under 35 U.S.C. § 103(a) as being obvious under 35 U.S.C. § 103 based on the collective teachings of Damani and Foster.

[1] The Examiner refers to this document as "ANL," (Ans. 14, 17), but we refer to the author, "Foster."

Rather than reiterate the arguments of Appellants (and the Examiner, reference is made to the Appeal Brief (filed, May 08, 2006), Reply Brief (filed, September 18, 2006), and Answer (mailed, Nov. 30, 2007) for the respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived. 37 C.F.R. § 41.37(c) (1) (vii).

FINDINGS OF FACT (FF)

1. Damani discloses a multiple-processor system that periodically logs messages to a non-local stable storage disk in the event one of the processors fails. The storage disk is accessible through a network server to the processors in the system. (§ 5: ¶ 2 "Stable Storage").

2. Damani describes a process crash: "A process loses all its volatile memory in a failure. To reduce the amount of wasted computation, it periodically writes its checkpoints to stable storage. After a failure, it is restarted from its last stable checkpoint." (§ 1: ¶ 4). Damani generally discloses several types of prior art message logging crash recovery schemes, which vary according to message types and amounts saved to stable storage (§ 2). Damani's disclosed system involves storing and sending some messages to input and/or output queues of LPs (logical processes) (§ 1, § 4, § 4.1: ¶ ¶ 7, 8), while saving and retrieving other messages from stable storage (§ 4, ¶ 2). For example, a cluster, or group of messages from one LP or several LPs on one processor, including checkpoints, are saved and restarted from stable storage (§ 4:¶ 1; §4.2: ¶ 3).

3. Ulrich discloses simulating interactive exercise machines on a computer network system. The computer monitors a machine user's relative position and direction with respect to other user's by displaying an icon/object. A display periodically updates the computer to provide a continuous display of the user in the simulated environment. (Ulrich, abstract; col. 8, ll. 25-32). Pedaling drive resistance in the exercise machine is controlled digitally by *inter alia*, magnetic particle brakes, hysterises brakes, electrical generators or torque motors to emulate traditional flywheel/freewheel arrangements. Light resistance simulates downhill travel while higher resistance simulates uphill travel and gear changes. (Col. 7, ll. 4-33). Strain gauges emulate steering tilt and desired direction of travel. (Col. 7, ll. 55-63)

4. Ulrich's computer system employs microprocessors and storage devices associated with same. "[R]egardless of the type of microprocessor employed" (col. 4, l. 59), such storage devices include at least one of CD-ROMs, hard disk drives, floppy disk drives, read only memories (ROMs), and random access memories (RAMs) for constructing a desired simulated environment and recording messages. (Fig. 2A, col. 4, ll. 52-67, col. 11, ll. 31-64).

5. Any of Ulrich simulating computers can be interconnected into a network via a hub so that information can be shared. The hub has a central processor, memory, an input queue, and output buffers, and input and output processors including modems (col. 7, ll. 34-55, col. 11, ll. 3-64; Figs. 8, 9, 12, 13).

6. Ulrich's hub records the new state of the user's icon/object by referencing an externally or internally maintained data base 172 containing

the location data of all users in the environment. The hub also sends messages stored in the input message queue to the correct users (col. 11, ll. 3-64; Fig. 13). Various messages packets include parameters such as user weight, pedal speed, and steering tilt so that each user's speed and position can be displayed on other user's monitors. (Col. 8, ll. 18-24). Whole simulated environments can be shared and/or locally stored. (Col. 8, ll. 37-40).

7. Appellants state: "It is noted that, while the log files in Figs. 1-3 are illustrated as separate from the nodes that write to them, the log files may generally be part of the node that writes the file. Alternatively, a separate storage (e.g. a network attached storage) may be used to store the log files." (Spec. 13: 22-25).

8. Stallmo discloses a redundant read operation, whereby when a modular control unit (MCU) and/or memory at a first node fails, a second or warm spare node is established, and another controlling MCU or target MCU of a third group of nodes causes other members of the third group comprising associated MCUs and memories to read data from such memories to rebuild the failed memory onto the warm spare second node or onto host memory. (Col. 4, ll. 44-50, col. 15, l. 24 to col. 16, l. 34)

PRINCIPLES OF LAW

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn,* 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence *of prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary

indicia of nonobviousness.") (quoting *In re Rouffet,* 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

Under § 102, Appellants may sustain this burden by showing that the prior art reference relied upon by the Examiner fails to disclose an element of the claim. It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

Under § 103, a holding of obviousness can be based on a showing that "there was an apparent reason to combine the known elements in the fashion claimed." *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007). Such a showing requires:

> "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id., 127 S. Ct. at 1741 (*quoting Kahn*, 441 F.3d at 988).

If the Examiner's makes such a showing, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

ANALYSIS

Anticipation - Damani

Appellants' arguments regarding the anticipatory rejection of claims 1, 20 and 31 under Damani are directed toward independent claim 1 without distinction. (App. Br. 5-6). Therefore, we select claim 1 as representative of this group.

Appellants dispute (App. Br. 5) the Examiner's finding (Ans. 4) that Damani teaches that "the at least one logging node is separate from nodes targeted by the message packets" as set forth in claim 1. We disagree with Appellants. Damani's stable storage medium, accessible to each processor via a separate server, is thereby separate from all the targeted nodes of LPs in each of the other processors of the system (*see* FF 1, 2). Appellants' argument that each node in Damani only logs the message packets that are targeted at that node (Reply Br. 2) does not account for such separate logging at the stable storage disk. We find that Damani's network server, in combination with the storage disk, constitutes a separate logging node as claimed (*see* FF 1).

We also note that Appellants' disclosure indicates that "separate" log files can be attached to any of the nodes or can be located at a network storage (FF 7). Thus, even if targeted nodes write to Damani's server accessible stable storage medium, the storage medium constitutes at least one logging node separate from targeted nodes, as set forth in the claim, contrary to Appellants' argument noted *supra* (Reply Br. 2). Accordingly, we sustain the Examiner's anticipatory rejection under Damani of claims 1, 20 and 31.

Anticipation - Ulrich

With respect to claims 1, 6, 10, 20, 25, 27, and 31, Appellants argue that Ulrich fails to teach certain claim limitation with respect to the following three groups of claims: a) 1, 20, and 31; b) 6 and 25; and c) 10 and 27. (App. Br. 7-11). Accordingly, we select claims 1, 6 and 10 as representative of each group.

Claims 1, 20 and 31

Appellants dispute the Examiner's finding that Ulrich's system logs messages in at least one non-volatile storage medium, as required by claim 1, because Ulrich's CPU only stores messages temporarily. (App. Br. 7). The Examiner cites Ulrich, elements 158, 160, 164 and 166 as storing data in a nonvolatile storage medium, including CD-ROMS, hard disk drives, floppy drives and ROMs. (Ans. 9-11, citing Ulrich Fig. 13). Appellants do not explain why such memory types constitute temporary storage or fail to constitute non-volatile memory. We find that such memory types cited by the Examiner reasonably constitute non-volatile memory, since data on such types, for example, a floppy disc, or CD-ROM, does not disappear when the power fails. (*See* FF 4, 5). As such, Appellants fail to meet the burden on appeal of demonstrating error.

We find that Ulrich's Figure 13 embodiment cited by the Examiner employs a hub processor to access a separate external database. (FF 5, 6). While Ulrich does not specifically mention the type of external database employed in the hub processor of Figure 13, Figure 13 represents a flow diagram for the hub-connected computers depicted in the Figures 8 and 9 embodiments. (*See* FF 5). Each hub-connected computer employs connected microprocessor/database systems including CD-ROMS, hard disk

drives, floppy drives and ROMs (i.e., non-volatile memory). (FF 4). Ulrich states that regardless of the type of microprocessor used, such microprocessors employ the memory types just mentioned (FF 4), thereby implying similar nonvolatile storage for the hub processor. Moreover, the hub processor stores messages in *external* memory (FF 6), which we find further implies, to one of skill in the art, nonvolatile storage. Therefore, the hub external memory constitutes non-volatile storage.

Alternatively, each hub-connected, removable, computer floppy disc, or CD-ROM disc, or a mere portion thereof, constitutes a separate non-volatile memory, because such memory, in light of Appellants' disclosure (*see* FF 7; Spec. 4: 19-26), constitutes, with the hub input processor and/or hub central processor, a separate logging node (*see* FF 4-6). Still further, under another interpretation, claim 1 does not require a logging node to consist of more than mere memory for logging. In that case, each non-volatile memory disc itself constitutes a separate logging node (*see* FF 4, 7). Accordingly, we are not persuaded by Appellants' arguments that Ulrich does not disclose a separate non-volatile memory logging node.

Appellants also argue that Ulrich's nodes do not communicate simulation commands and signal values using message packets. (App. Br. 8-9). Appellants do not explain why or how the Examiner erred in finding that such commands and signal values are met by Ulrich's messages regarding icon position, pedal speed, steering tilt, direction, commands such as go, stop, and all other information required to allow users to navigate freely in the same simulated environment. (*See* Ans. 10-11, App. Br. 8-9). As such, Appellants fail to meet the burden on appeal of demonstrating error as to the Examiner's finding with which we concur (*see* FF 3, 6).

We are also not persuaded by Appellants' argument that Ulrich teaches simulating exercise machines but not electronic systems. (App. Br. 9). We disagree with Appellants. As the Examiner generally found, Ulrich's system simulates electronic bicycle systems (Ans. 11). We concur with the Examiner. The system includes the simulation of electrically controlled generators and strain gauges, and of pedaling, relative positions, speeds and directions of all users of such electronic devices. (FF 3, 6).

Appellants' argument (Reply Br. 3-4) that Ulrich's simulated electronic system does not constitute a system under test does not explain why simulating the pedaling of an electric generator with electronic brakes does not constitute a system under test. If one such device and/or its processor fail, we infer that the devices' relative position will be displayed as either stationary or not displayed – signifying a test failure.

Moreover, the nomenclature "under test" does not functionally relate "the system under test" to the "simulation system" set forth in the claim. Therefore, the descriptive term "under test" constitutes non-functional descriptive material that cannot render an otherwise unpatentable claim patentable.[2] In other words, regardless of whether or not Appellants' "system under test" is actually under test, for example, an input/output component board (*see* Spec. 5: 6-15), the claimed simulation system does not alter its procedures. Appellants argue that the simulation of the system

[2] *In re Ngai*, 367 F.3d 1336, 1339 (Fed. Cir. 2004); *Ex parte Curry*, 84 USPQ2d 1272, 1275 (BPAI 2005) (Informative Opinion) (Affirmed, Rule 36, Fed. Cir., slip op. 06-1003, June 2006) ("Common situations involving non-functional descriptive material [include] . . . .a computer that differs from the prior art solely with respect to nonfunctional descriptive material that cannot alter how the machine functions (i.e., the descriptive material does not reconfigure the computer) . . . .").

under test defines the nodes.[3] We disagree. The *system* (e.g., component board) defines the nodes. That is, the system under test, as claimed, is simply simulated regardless of whether or not it is under test. Ulrich's system does no less.

Accordingly, we sustain the Examiner's anticipatory rejection of claims 1, 20 and 31 under Ulrich.

Claims 6 and 25

Appellants dispute the Examiner's finding that Ulrich's hub constitutes a logging node as required by representative claim 6. (App. Br. 10). Appellants argue that Ulrich's hub maintains the databases, and therefore, all messages are targeted at the hub. As such, Appellants maintain that Ulrich's hub/logging node is not "separate from nodes targeted by the message packets" as required by claim 1 from which claim 6 depends. (Reply Br. 5). We disagree.

As the Examiner found, Ulrich's hub records messages to an *external* database (Ans. 11-12, FF 5, 6). While the hub may also forward messages to targeted users as determined by accessing said external database (FF 5, 6), this does not mean that the hub itself is targeted, especially where Appellants fail to define the term clearly. For example, Appellants' hub "parses the message packets and forward message packets to the destination node or nodes for the message," (Spec. 6: 20-21). Similarly, Ulrich's central hub processor accesses messages in an input queue, reads an internal and/or external database, and sends appropriate messages or data to an outgoing

[3] Appellants' argument is in response to the Examiner's related reasoning that the phrase "under test" recites a mere statement of intended use. (App. Br. 8, Final Office Action at 3, mailed November 30, 2005).

buffer before sending messages to the appropriate user. (FF 5, 6). Thus, Ulrich's input processor/queue, or each separate hub-connected processor/ memory for example, may be considered as targeted, such that the hub processor/external memory constitute a separate logging node in a manner consistent with Appellants' disclosure (*see also* FF 7). Alternatively, if Appellants are correct that the central hub/external memory is targeted, then it follows that each of Ulrich's hub processor/removable disc combinations are untargeted and constitute together a separate logging node.

Accordingly, we sustain the Examiner's rejection of claims 6 and 25.

Claims 10 and 27

Appellants contend that Ulrich does not disclose a distributed control node (DCN) as required by representative claim 10. (Reply Br. 5-6). Appellants assert, *inter alia*, that a DCN is not part of the system under test, but instead logs data. (*Id.*, citing Spec. 6:8-11). We find that as defined by Appellants' disclosure, Ulrich's hub constitutes a DCN because it logs data and is not part of the electronic bicycle (i.e., generator, strain gauge) portion of the system under test. (*See* FF 5-6). Thus, we sustain the Examiner's rejection of claims 10 and 27.

Obviousness – Damani with Stallmo

Claims 2, 5, 21, 24, 32, and 35

Appellants' focus their arguments on independent claims 2, 21 and 32 without distinction and assert that Stallmo fails to teach wherein a "third node of the plurality of nodes is configured to read message packets that were transmitted to the first node from the log file and to transmit the message packets to the second node," as recited in claim 2 (App. Br. 16-18).

Appellants maintain that the Examiner erred in finding that Stallmo's control processor 203 (which rebuilds data from a failed storage device (i.e., first node) and writes it to a warm spare (i.e., second node)) constitutes the claimed third node, because the third node does not read the message packets. (App. Br. 16-17, Ans. 12-13).

We disagree with Appellants. We find generally as the Examiner did, that Stallmo reasonably teaches a third node comprising a group of MCUs 203 meeting the claim – the group including a controlling MCU 203 and other reading MCUs 203 (*see* FF 8). In other words, Stallmo's third node comprises more than one MCU 203 such that the third node reads data as claimed. Appellants similarly disclose that a node may comprise more than one processor. (Spec. 4: 21-25).

Claims 21 and 32 do not recite a third node. Accordingly, with respect to those claims, Appellants arguments are not commensurate in scope therewith. Mere repetition of claim elements does not constitute an argument for patentability. (*See* App. Br. 17; 37 C.F.R. § 41.37(c) (1) (vii)).

Accordingly, we sustain the Examiner's rejection of independent claims 2, 21 and 32, and dependent claims 5, 24 and 35 not separately argued (*see* App. Br. 17-18).

Claims 3, 22, and 33

Appellants' focus their arguments primarily on representative claim 3 and assert that Damani's system does not "resume the simulation subsequent to transmitting the message packets from the log file to the second node." (App. Br. 18). Appellants acknowledge that Damani teaches restarting the simulation. (*Id.*) Indeed, Damani's system restarts the simulation after a failure as the Examiner generally indicated (FF 1, 2; Ans. 13-14). Claim 3,

which depends from claim 2, requires resuming the simulation after the system rebuilds the second node. Stallmo's system rebuilds that second node, after the first fails, as the Examiner generally found with respect to claim 2, as discussed *supra*. Therefore, combining Damani's and Stallmo's systems in a manner meeting claim 3 constitutes a predicable use of prior art elements according to their established functions. *See KSR*, 127 S.Ct. at 1740.

We also note that Appellants do not respond directly to the Examiner's finding as outlined in the Answer, but rather, assert that since Damani fails to teach the features of claims 1, 20, and 31, Damani also fails to teach the features of dependent claims 3, 22, and 33 (Reply Br. 6). Since we have found that Damani meets claims 1, 20, and 31, Appellants' arguments do not demonstrate error in the Examiner's position.

Accordingly, we sustain the Examiner's rejection of independent claims 3, 22 and 33.

Claims 4, 23, and 34

Appellants' focus their arguments primarily on representative claim 4, and assert that Stallmo's system does not teach that "the third node is configured to verify that the second node transmits corresponding message packets." (App. Br. 19). Appellants contend that Stallmo does not teach verifying. The Examiner generally found that Stallmo teaches the claimed feature by referring to Stallmo's "target MCU" as a verifying third node. (Ans. 14). We find that the target MCU 203 (i.e., third node) reasonably verifies data because it "tests whether it has received all necessary data from the other MCUs 203" and employs parity bits to rebuild the data (i.e., from

the first node) which it sends to the host computer 201 (second node). (Stallmo, col. 16, ll. 14-34).

Therefore, we sustain the Examiner's rejection of claims 4, 23 and 34.

Obviousness – Damani and Foster – claims 29 and 36

Appellants assert that Foster's (i.e., ANL's) system does not teach the additional features of claims 29 and 36 because Foster merely teaches modular systems (App. Br. 22-23). We find that the Examiner's Answer does focus on Foster's modular teachings and we fail to see how those teachings correspond to the claimed features of claims 29 and 36 (Ans. 7). The Examiner responded to Appellants' arguments by focusing on Appellants' statement respectively relating a previous and current simulation to the claim recitations involving transmitted message packets and a second simulation. (*See* Ans. 14-15, App. Br. 22-23). The Examiner maintained that Appellants' statement was not commensurate in scope with the claims because the claims lack any recitation of a previous simulation. (*Id.*) In response, Appellants clarified their position (Reply Br. 7-8). We find that Appellants reasonably met their burden of asserting error in the Examiner's position, and that the Examiner failed to present a prima facie case of patentability and to demonstrate clearly why the combination would have been obvious. *See Kahn,* 441 F.3d at 985-86.

Accordingly, we will not sustain the Examiner's rejection of claims 29 and 36.

DECISION

We affirm the Examiner's decision rejecting claims 1-6, 10, 20-25, 27, and 31-35. We reverse the Examiner's decision rejecting claims 29 and 36.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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